BASEMENT 27B

INDIAN TEA ASSOCIATION

SCIENTIFIC DEPARTMENT

ANNUAL REPORT—1942

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In 1942 Messrs. Comrie and Winter and Drs. Roberts, Wight and Woodford also our Tea Taster Mr. Gilchrist went away on war service. This year Messrs. Benton Harrison and Macgregor have been employed on water purification work at the I.T.A. labour camps on the various Eastern Frontier Projects. Mr. Benton had for several years been investigating the possibilities of the sliver process for the sterilization of water with the object of adapting it for use on tea estates. The process as used at the labour camps has been effective and at the same time very simple in application whilst it imparted no taint to the treated water, and thus obviated any difficulty that might have arisen in getting the labourers to drink the treated water as would have been the case if chlorination had been employed, This process has been in continuous use with very satisfactory results. Unfortunately Mr. Benton, who was far from being a fit man when he first went to the work at Dimapur, became seriously ill and had to be taken to hospital. He was however very ably assisted by Mr. Simmons of the Jorehaut Tea Coy., Ltd. This work has become much extended and a staff of not less than 6 are now controlling this work. Messrs. Harrison and Macgregor attending to the scientific side of the work and the others dealing more particularly with the new installations and the maintenance work. As regular routine a close and careful bacteriological examination of the treated water is made frequently. The unit as whole is known as the T.U. or Tocklai Unit. At the end of the year there were at work 40 installations some supplying several thousands gallons of water per diem whilst others were only required to supply a few hundred gallons.

Mr. Harrison and our Senior Assistant chemist Mr. Sen Gupta were the first to install the process on the Ledo road project. Soon

after they had commenced Mr. Harrison was called away to help the evacuation from Burma, and for his outstanding work in this connection he has recently been awarded the honour of the O.B.E.

Messrs. Deb and Dinanath Barua, assistants in the chemical branch, were sent to help Mr. Sen Gupta. Subsequently Mr. Deb was recruited to the I.A.O.C. laboratories at Cawnpore.

Mr. Tunstall and myself were the only senior officers left at Tocklai. At the request of the Military authorities Mr. Tunstall conducted a jungle lore school for training cadres. He also gave lectures at other training schools.

Owing to the war conditions and the absence on military duty of our taster Mr. Gilchrist, it has not been possible to carry out individual bush manufacture during the year. It has however been possible to nearly complete the vegetative reproduction of the bushes that had already been selected for their characteristics in the finished teas.

A field experiment has been planted with five clones prepared from bushes selected from the Betjan plot at Borbhetta. The object of the experiment is to ascertain how closely the teas from the clone plots resembles the teas from the original bush and whether the teas from the different clone plots bear the same relation to each other as do the original bushes.

Another field experiment has been planted with the object of finding how bushes raised from cuttings compare with bushes of the same jat raised from seed. It has been found that individual bushes differ greatly in the readiness with which the cuttings form roots. An experiment was carried out to ascertain whether the rooting tendency bore any relation to the character of the teas made from the bushes. Six bushes having highly desirable characters in the finished teas and six bushes having characteristics of low desirability were chosen and cuttings raised. The results shew that the cuttings from the low quality bushes formed roots more readily than the cuttings from the good bushes. The experiment also shewed a very highly significant difference in favour of the

rooting of cuttings of green wood rather than of red wood. There was however no difference in the ability to form roots whether the cuttings were taken from a mother stem or from a lateral.

The work on artificial pollination has been confined to tests for compatibility. In one case germination was as high as 79% but in the case of artificial self pollination the results were again low 24% of the bushes giving less than 10% successful germination.

It has been noticed that the characters of an individual bush could vary with the green colour of the new flush compared with the leaf colour of the older leaves of the same bush. This made it necessary to investigate the chlorophyll of the leaves, and the methods for separating the pigments. This work is in progress but is suffering much restriction from lack of workers and from difficulties in obtaining the requisite reagents. The estimation of starch in roots is also much interrupted by lack of the necessary chemicals. Further work on black rot (Corticum invisum) shewed that the fungus failed to survive on dry branches or in damp soil. On growing bushes the black rot was found to survive the cold weather on the bark as far down as 8 inches below the top pruning level.

Work has been continued on Branch Canker and Red Rust.

The possibility of using a water extract of tea waste for dyeing cotton cloth was investigated. A fast dye was obtained by mordanting the cloth with a copper salt. The colour seemed to be fast to sunlight and to soap.

At the request of the military some mechanical analyses of soil were carried out in connection with making runways at aerodromes.

The laboratory work has suffered much dislocation owing to the absence of officers upon work of military importance, and also to the occupation of Tocklai by the military. It was however realised that whilst this delay in the carrying on of experiments was regrettable yet a similar interference with the long term

field experiments would be much more serious and was to be avoided if possible. Every effort has therefore been made to maintain the field experiments.

The following list shews the more important experiments that are being maintained :—

Comparison of different methods of cultivation and the interactions with manuring severity of pruning time of pruning.

Comparison of the relative value of different forms of nitrogenous manure.

The effect upon crop and quality of different quantities of nitrogen applied as a manure.

The effect of varying the time of application of manure.

" " " methods of application.

The effect of shade trees and their interaction with manures on mature and young tea.

The relative value of different kinds of shade trees.

Comparison of different jats of tea grown with and without shade and manures.

The value of prunings applied with and without additional nitrogen.

The effect of Bogamedeloa.

Comparison of different degrees severity of heavy pruning and the interaction with time of year.

Comparison of varying degrees of severity in cleaning out when top pruning.

Effect of time of year upon top pruning.

Effect of frequency of top pruning.

Effect of varying the length of new wood left at the time of top pruning.

Comparison of different methods of plucking both in regard to fineness and closeness.

Variations in the depth of planting young tea.

Manuring of young tea.

The pruning of young tea both as regard severity and time of year.

Trial of wound paints.

Effect of shade upon branch canker—sun scorch.

Defoliation as a preventitive against red spider.

We have received the returns from 41 field experiments on tea estates. I wish to take this opportunity to express my appreciation of the co-operation the Managers of the various gardens have given in continuing these experiments and in maintaining under very difficult circumstances the high degree of accuracy that is required to make the results useful.

In April the military requisitioned the General Office, the Botanical laboratory, the Guest House, and Bungalows Nos. 2 and 3.

Subsequently they also requisitioned bungalows Nos. 5 and 6. All these buildings are still retained by the military.

The rental was fixed by the Deputy Commissioner of Sibsagar and has been regularly paid.

When the Botanical laboratory was requisitioned the Botanical work was transferred to the insectary of the Entomological Branch. This gave very cramped accommodation and of course has limited the amount of work that could be done.

During the year two memoranda have been published :—

No. 14 Red Rust by A. C. Tunstall.

No. 15 Some general information on the selection and propagation of the tea plant.

The health of the station has been good and the anti-malarial measures have been effectively carried under the supervision of our Assisstant Medical Officer Dr. Sen. These control measures which have been in operation for some years have in my opinion added very materially to the efficiency of the officers of the station by keeping them free from malaria. This work requires unremitting attention if it is to be effective.

P. H. CARPENTER,

Director.